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09/975,636	10/11/2001	Karl James Molnar	8194-512	8389

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EXAMINER	
FAN, CHIEH M	

ART UNIT	PAPER NUMBER
2634	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/975,636	Applicant(s) MOLNAR, KARL JAMES	
	Examiner Chieh M Fan	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,10,11,13-22,25-36,43-48* is/are rejected.

7)☒ Claim(s) *4-9,12,23,24 and 37-42* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/01,08/02,01/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 13-18, 27-33 and 43-48 are objected to because of the following informalities:

Regarding claim 13, it appears that "partitioning the sequence of symbols" in line 10 should be changed to --- partitioning the second sequence of symbols ---.

Regarding claim 27, it appears that "partitions the sequence of symbols" in line 10 should be changed to --- partitions the second sequence of symbols ---.

Regarding claim 43, it appears that "partitioning the sequence of symbols" in line 10 should be changed to --- partitioning the second sequence of symbols ---.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 13-18, 27-33 and 43-48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 13-18, as recited in lines 11-12 and 14-15 of claim 13, there is only one desired demodulation type is determined for use in demodulating the subfields. Therefore, it is not clear how to perform the step of "demodulating the subfields using the respective determined desired demodulation types" as recited in the last two lines of claim 13. There is insufficient antecedent basis for the limitation "the respective determined desired demodulation types".

Regarding claims 27-33, as recited in lines 12-13 and 14-15 of claim 27, there is only one desired demodulation type is determined for use in demodulating the subfields. Therefore, it is not clear how to "demodulates the subfields using the respective determined desired demodulation types" as recited in the last two lines of claim 27. There is insufficient antecedent basis for the limitation "the respective determined desired demodulation types".

Regarding claims 43-48, as recited in lines 12-13 and 14-15 of claim 43, there is only one desired demodulation type is determined for use in demodulating the subfields. Therefore, it is not clear how to "demodulate the subfields using the respective determined desired demodulation types" as recited in the last two lines of claim 43. There is insufficient antecedent basis for the limitation "the respective determined desired demodulation types".

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 10, 11, 19-22, 25, 26 and 34-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Skold et al. (WO 98/38750, listed in the IDS filed 8/12/02, "Skold" hereinafter).

Regarding claim 1, Skold teaches a method of processing a received signal, comprising: receiving the signal (96 in Fig. 6) to provide a sequence of symbols associated with the received signal in respective ones of a plurality of symbol positions; identifying a known block of the sequence of symbols containing known symbol values and an unknown block of the sequence of symbols containing unknown symbol values (page 14, line 28 through page 15, line 3); determining a desired demodulation type for use in demodulating the unknown block based on the known symbol values (108, 136, 128, 118 in Fig. 6, note that the selector 108 output the signal 134 based on 102); detecting an interferer signal characteristic discontinuity location in the unknown block (page 15, lines 7-9); and demodulating the unknown block using a first selected demodulation type (128 in Fig. 6) between the interferer signal characteristic discontinuity and the known block and a second selected demodulation type (118 in Fig.

6) on another portion of the unknown block, the first selected demodulation type and the second selected demodulation type being selected based on the determined desired demodulation type for use in demodulating the unknown block and the detected interferer signal characteristic discontinuity (114 in Fig. 6).

Regarding claim 2, Skold further teaches selecting either non-interferer cancellation (128 in Fig. 6) or interferer cancellation demodulation (118 in Fig. 6) as the desired demodulation type for use in demodulating the unknown block.

Regarding claim 3, Skold further teaches estimating interferer signal characteristics for the known block and selecting either non-interferer cancellation or interferer cancellation demodulation based on the estimated interferer signal characteristics (106 in Fig. 6).

Regarding claim 10, Skold further teaches that the estimated interferer characteristics include at least one characteristic selected from the group consisting of desired signal carrier power, noise power, interference, signal power or a ratio calculated based on ones of desired signal carrier power, noise power, interference and signal power (page 17, lines 5-9).

Regarding claim 11, Skold further teaches detecting a plurality of interferer signal characteristic discontinuities and selecting an appropriate detector accordingly (page 7, line 26 through page 8, line 6).

Regarding claim 19, Skold teaches a system for processing a received signal comprising: a receiver that receives the signal to provide a sequence of symbols associated with the received signal (96 in Fig. 6) in respective ones of a plurality of

symbol positions; an identification circuit that identifies a known block of the sequence of symbols containing known symbol values and an unknown block of the sequence of symbols containing unknown symbol values (page 14, line 28 through page 15, line 3); a determination circuit that determines a desired demodulation type for use in demodulating the unknown block based on the known symbol values (108, 136, 128, 118 in Fig. 6, note that the selector 108 output the signal 134 based on 102); a detector circuit that detects an interferer signal characteristic discontinuity location in the unknown block (page 15, lines 7-9); and a demodulator that demodulates the unknown block using a first selected demodulation type (128 in Fig. 6) between the interferer signal characteristic discontinuity and the known block and a second selected demodulation type on another portion of the unknown block, the first selected demodulation type and the second selected demodulation type (118 in Fig. 6) being selected based on the determined desired demodulation type for use in demodulating the unknown block and the detected interferer signal characteristic discontinuity (114 in Fig. 6).

Regarding claim 20, the desires demodulation type is selected from the group consisting of non-interferer cancellation (128 in Fig. 6) and interferer cancellation (118 in Fig. 6).

Regarding claim 21, the determination circuit is further configured to estimate interferer signal characteristics for the known block and selects the desired demodulation type based on the estimated interferer signal characteristics (106 in Fig. 6).

Regarding claim 22, Skold teaches that the interference is caused by co-channel interference (page 4, lines 1-5).

Regarding claim 25, the system comprises a mobile terminal (page 5, line 24-25).

Regarding claim 26, the system comprises a base station transceiver (page 5, lines 25-27).

Regarding claim 34, Skold teaches a system for processing a received signal, the system comprising: means for receiving the signal to provide a sequence of symbols associated with the received signal in respective ones of a plurality of symbol positions (76 in Fig.4, 96 in Fig. 6); means for identifying a known block of the sequence of symbols containing known symbol values and an unknown block of the sequence of symbols containing unknown symbol values (page 14, line 28 through page 15, line 3); means for determining a desired demodulation type for use in demodulating the unknown block based on the known symbol values (108, 136, 128, 118 in Fig. 6, note that the selector 108 output the signal 134 based on 102); means for detecting an interferer signal characteristic discontinuity location in the unknown block (page 15, lines 7-9); and means for demodulating the unknown block using a first selected demodulation type (128 in Fig. 6) between the interferer signal characteristic discontinuity and the known block and a second selected demodulation type (118 in Fig. 6) on another portion of the unknown block, the first selected demodulation type and the second selected demodulation type being selected based on the determined desired demodulation type for use in demodulating the unknown block and the detected interferer signal characteristic discontinuity (114 in Fig. 6).

Regarding claim 35, Skold further teaches the means for selecting (108, 136 in Fig. 6) either non-interferer cancellation (128 in Fig. 6) or interferer cancellation demodulation (118 in Fig. 6) as the desired demodulation type for use in demodulating the unknown block.

Regarding claim 36, Skold also teaches the means for estimating interferer signal characteristics for the known block and selecting either non-interferer cancellation or interferer cancellation demodulation based on the estimated interferer signal characteristics (106 in Fig. 6).

6. Claims 1, 2,19, 20, 34 and 35 are rejected under 35 U.S.C. 102(a) as being anticipated by Chandrasekaran et al. ("A constrained least-squares algorithm with data adaptive beamforming and equalization for cochannel TDMA signals," Signal Processing 80 (2000), pages 2033-2047, listed in the IDS filed 8/12/02, "Chandrasekaran" hereinafter). Note that the Chandrasekaran paper was published in October 2000, but the exact date is unknown. A rejection under 102(a) is made since it cannot be determined whether the paper was published more than one year or not.

Regarding claim 1, Chandrasekaran teaches a method of processing a received signal, comprising: receiving the signal (Fig. 2) to provide a sequence of symbols associated with the received signal in respective ones of a plurality of symbol positions; identifying a known block of the sequence of symbols containing known symbol values and an unknown block of the sequence of symbols containing unknown symbol values (Section 3.2.1, lines 1-7; Note that since the data structure is known as shown in Fig. 2,

the edges of each slot are identified once the location of the training sequence in each slot is identified. Also see Fig.1 and the last 3 lines of the right column on page 2037); determining a desired demodulation type for use in demodulating the unknown block based on the known symbol values (Sections 3.2.2 and 3.2.3, especially equation 14; that is, the weights are determined from the training sequence); detecting an interferer signal characteristic discontinuity location in the unknown block (Section 3.2.1, lines 1-7, Fig. 1 and the last 3 lines of the right column on page 2037; As explained above, the edges of each slot and the location of the training sequence are identified.); and demodulating the unknown block using a first selected demodulation type (Section 3.2.2, especially the last 4 lines) between the interferer signal characteristic discontinuity and the known block and a second selected demodulation type (Section 3.2.3, especially the first 8 lines) on another portion of the unknown block, the first selected demodulation type and the second selected demodulation type being selected based on the determined desired demodulation type for use in demodulating the unknown block and the detected interferer signal characteristic discontinuity (the selection depends on the location of the edges, e.g. k=162, 167).

Regarding claim 2, Chandrasekaran further teaches selecting either non-interferer cancellation (Section 3.2.2) or interferer cancellation demodulation (Section 3.2.3, lines 4-8) as the desired demodulation type for use in demodulating the unknown block.

Regarding claim 19, Chandrasekaran teaches a system for processing a received signal comprising: a receiver that receives the signal to provide a sequence of

symbols associated with the received signal (Fig. 2) in respective ones of a plurality of symbol positions; an identification circuit that identifies a known block of the sequence of symbols containing known symbol values and an unknown block of the sequence of symbols containing unknown symbol values (Section 3.2.1, lines 1-7; Note that since the data structure is known as shown in Fig. 2, the edges of each slot are identified once the location of the training sequence in each slot is identified. Also see Fig.1 and the last 3 lines of the right column on page 2037); a determination circuit that determines a desired demodulation type for use in demodulating the unknown block based on the known symbol values (Sections 3.2.2 and 3.2.3, especially equation 14; that is, the weights are determined from the training sequence); a detector circuit that detects an interferer signal characteristic discontinuity location in the unknown block (Section 3.2.1, lines 1-7, Fig. 1 and the last 3 lines of the right column on page 2037; As explained above, the edges of each slot and the location of the training sequence are identified.); and a demodulator that demodulates the unknown block using a first selected demodulation type (Section 3.2.2, especially the last 4 lines) between the interferer signal characteristic discontinuity and the known block and a second selected demodulation type on another portion of the unknown block, the first selected demodulation type and the second selected demodulation type (Section 3.2.3, especially the first 8 lines) being selected based on the determined desired demodulation type for use in demodulating the unknown block and the detected interferer signal characteristic discontinuity (the selection depends on the location of the edges, e.g. k=162, 167).

Regarding claim 20, the desires demodulation type is selected from the group consisting of non-interferer cancellation (Section 3.2.2) and interferer cancellation (Section 3.2.3, lines 4-8).

Regarding claim 34, Skold teaches a system for processing a received signal, the system comprising: means for receiving the signal to provide a sequence of symbols associated with the received signal in respective ones of a plurality of symbol positions (Fig. 2); means for identifying a known block of the sequence of symbols containing known symbol values and an unknown block of the sequence of symbols containing unknown symbol values (Section 3.2.1, lines 1-7; Note that since the data structure is known as shown in Fig. 2, the edges of each slot are identified once the location of the training sequence in each slot is identified. Also see Fig.1 and the last 3 lines of the right column on page 2037); means for determining a desired demodulation type for use in demodulating the unknown block based on the known symbol values (Sections 3.2.2 and 3.2.3, especially equation 14; that is, the weights are determined from the training sequence.); means for detecting an interferer signal characteristic discontinuity location in the unknown block (Section 3.2.1, lines 1-7, Fig. 1 and the last 3 lines of the right column on page 2037; As explained above, the edges of each slot and the location of the training sequence are identified); and means for demodulating the unknown block using a first selected demodulation type (Section 3.2.2, especially the last 4 lines) between the interferer signal characteristic discontinuity and the known block and a second selected demodulation type (Section 3.2.3, especially the first 8 lines) on another portion of the unknown block, the first selected demodulation type and the

second selected demodulation type being selected based on the determined desired demodulation type for use in demodulating the unknown block and the detected interferer signal characteristic discontinuity (the selection depends on the location of the edges, e.g. k=162, 167).

Regarding claim 35, Skold further teaches the means for selecting either non-interferer cancellation (Section 3.2.3, lines 4-8) or interferer cancellation demodulation (Section 3.2.3, lines 4-8) as the desired demodulation type for use in demodulating the unknown block.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chandrasekaran et al. ("A constrained least-squares algorithm with data adaptive beamforming and equalization for cochannel TDMA signals," Signal Processing 80 (2000), pages 2033-2047, listed in the IDS filed 8/12/02, "Chandrasekaran" hereinafter) in view of Skold et al. (WO 98/38750, listed in the IDS filed 8/12/02, "Skold" hereinafter).

Chandrasekaran teaches the claimed invention (see the rationale applied to claim 19 above), but does not specify the system comprises a mobile terminal or a base station transceiver. Skold, in the same field of endeavor, teaches a system of canceling co-channel interference comprises a mobile terminal (page 5, lines 24-25) or a base station transceiver (page 5, lines 25-27). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to the interference-canceling system of Chandrasekaran in a mobile terminal or a base station transceiver, so as to cancel co-channel interference in the received signal of a mobile terminal or a base station transceiver.

Allowable Subject Matter

9. Claims 4-9, 12, 23, 24 and 37-42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Skold et al. (U.S. Patent No. 5,933,768), Arslan et al. (U.S. Patent No. 6,832,080), Khayrallah et al. (U.S. Patent No. 6,320,919).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (571) 272-3042. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chieh M Fan
Primary Examiner
Art Unit 2634

March 17, 2005